

7027-A

7027-A
BEAM POWER TUBE

For high-fidelity audio-amplifier applications

Supersedes Type 7027

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.9	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to plate	1.5	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	10	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7.5	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	-14	volts
Plate Resistance (Approx.)	22500	ohms
Transconductance	6000	μmhos
Plate Current	72	ma
Grid-No.2 Current	5	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	4.62"
Maximum Seated Length	4.06"
Maximum Diameter	1.63"
Bulb	T12
Base	Small-Wafer Octal 8-Pin with "950" Sleeve (JEDEC Group 1, No.B8-191)
Basing Designation for BOTTOM VIEW	8HY

Pin 1 - Grid No.2
Pin 2 - Heater
Pin 3 - Plate
Pin 4 - Grid No.2
Pin 5 - Grid No.1

Pin 6 - Grid No.1
Pin 7 - Heater
Pin 8 - Cathode, Grid No.3

PUSH-PULL AF POWER AMPLIFIER — Class AB_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	600	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	500	max.	volts
GRID-No.2 INPUT	5	max.	watts
PLATE DISSIPATION	35	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

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Typical Operation with Fixed Bias:

Values are for 2 tubes

Plate Voltage	400	450	540	volts
Grid-No.2 Voltage	300	350	400	volts
Grid-No.1 (Control-Grid) Voltage●	-25	-30	-38	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	50	60	76	volts
Zero-Signal Plate Current	102	95	100	ma
Max.-Signal Plate Current	152	194	220	ma
Zero-Signal Grid-No.2 Current	6	3.4	5	ma
Max.-Signal Grid-No.2 Current	17	19.2	21.4	ma
Effective Load Resistance (Plate to plate)	6600	6000	6500	ohms
Total Harmonic Distortion	2	1.5	2	%
Max.-Signal Power Output	34	50	76	watts

Typical Operation with Cathode Bias:

Values are for 2 tubes

Plate Supply Voltage	400	380	425	volts
Grid-No.2 Supply Voltage	300	380	425	volts
Cathode Resistor	200	180	200	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage	57	68.5	86	volts
Zero-Signal Plate Current	112	138	150	ma
Max.-Signal Plate Current	128	170	196	ma
Zero-Signal Grid-No.2 Current	7	5.6	8	ma
Max.-Signal Grid-No.2 Current	16	20	20	ma
Effective Load Resistance (Plate to plate)	6600	4500	3800	ohms
Total Harmonic Distortion	2	3.5	4	%
Max.-Signal Power Output	32	36	44	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:●

For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB_1

Grid No. 2 of each tube connected to tap on plate winding of output transformer

Maximum Ratings, *Design-Maximum Values:*

PLATE AND GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	600 max.	volts
GRID-No.2 INPUT	4.5 max.	watts
PLATE DISSIPATION	35 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts



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Typical Operation:

Values are for 2 tubes

Plate Supply Voltage.	410	volts
Grid-No.2 Supply Voltage.	*	volts
Cathode Resistor.	220	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage. .	68	volts
Zero-Signal Cathode Current	134	ma
Max.-Signal Cathode Current	155	ma
Effective Load Resistance (Plate to plate).	8000	ohms
Total Harmonic Distortion	1.6	%
Max.-Signal Power Output.	24	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:● For cathode-bias operation.	0.5 max.	megohm

○ Without external shield.

▲ The dc component must not exceed 100 volts.

● The type of input coupling network used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

* Obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center-tap (B+) so as to apply 43 per cent of the plate signal voltage to grid-No.2 of each output tube.

OPERATING CONSIDERATIONS

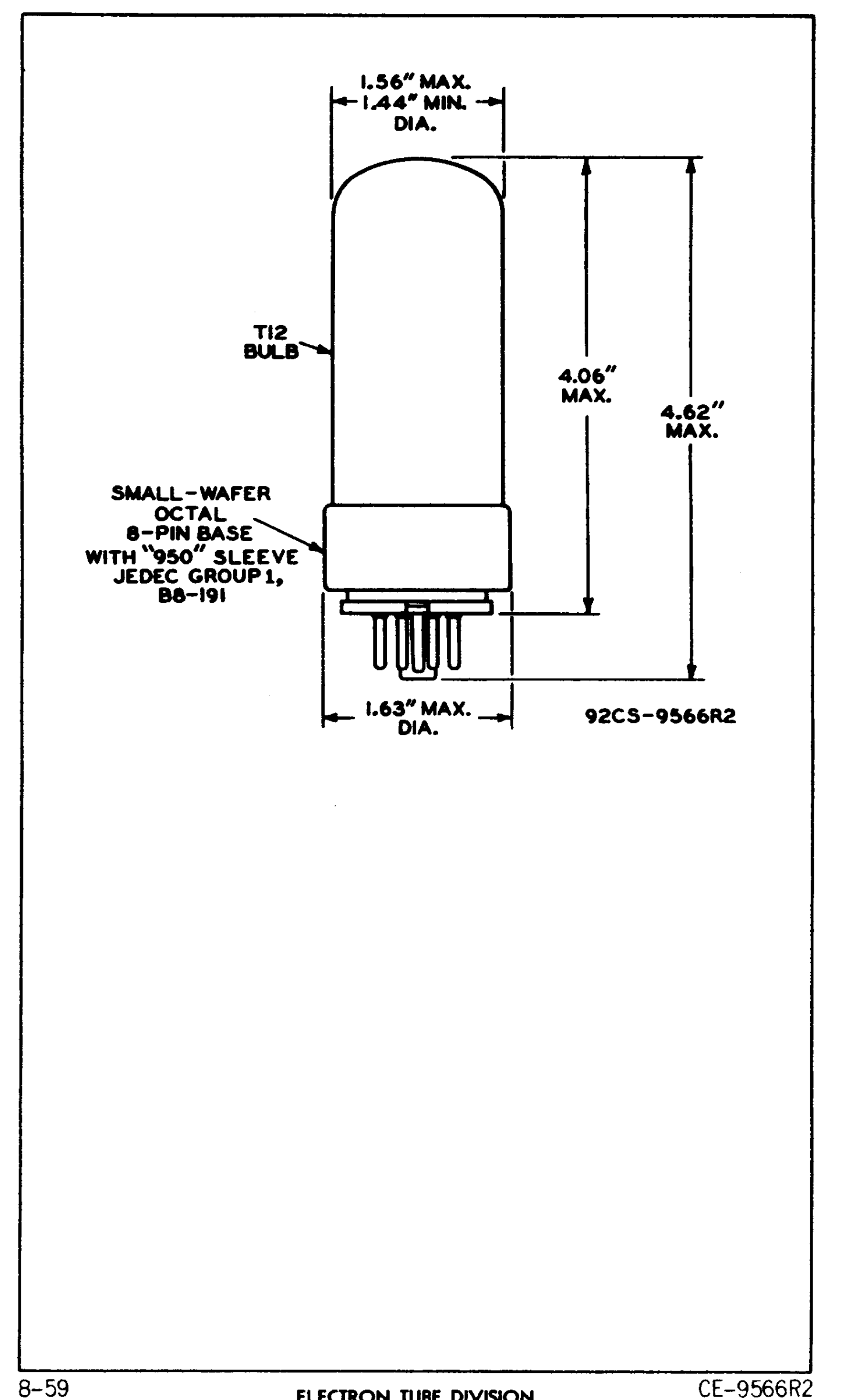
The *bulb* becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided around the 7027-A.

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AVERAGE PLATE CHARACTERISTICS

Ef=6.3 VOLTS
GRID-No1 VOLTS=0

GRID-No2 VOLTS Ec2=250

Ec2=450, 400, 350, 300, 250, 200, 150, 100, Ec2=50

PLATE VOLTS: 0, 100, 200, 300, 400, 500, 600, 700

PLATE MILLIAMPERES: 400, 300, 200, 100, 0

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AVERAGE CHARACTERISTICS

E_f = 6.3 VOLTS
GRID-№2 VOLTS = 300

GRID-№1 VOLTS E_{c_1} = 0, -5, -10, -15, -20, -25, -30, -35, -40, -45

I_b I_{c_2}

PLATE VOLTS: 0, 100, 200, 300, 400, 500, 600, 700

PLATE (I_b) OR GRID-№2 (I_{c_2}) MILLIAMPERES: 300, 200, 100, 0

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AVERAGE CHARACTERISTICS

E_f = 6.3 VOLTS
PLATE VOLTS = 300
GRID-№2 VOLTS = 300

I_b
I_{C2}

PLATE MILLIAMPERES (I_b): 250, 200, 150, 100, 50

GRID-№2 MILLIAMPERES (I_{C2}): 20, 10, 0

GRID-№1 VOLTS: -40, -30, -20, -10, 0

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OPERATION CHARACTERISTICS

PUSH-PULL CLASS AB_1

E_f = 6.3 VOLTS PLATE VOLTS = 540	GRID-№2 VOLTS = 400 GRID-№1 VOLTS = -38	AF GRID-№1-TO-GRID-№1 VOLTS (RMS) = 53.7

POWER OUTPUT

TOTAL

3rd

5th

7th

POWER OUTPUT—WATTS

0 10 20 30 40 50 60 70 80

HARMONIC DISTORTION—PER CENT

0 2 4 6 8 10 12

2000 4000 6000 8000 10000

EFFECTIVE LOAD RESISTANCE (PLATE TO PLATE)—OHMS

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AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION

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